

## LOGISTICS ORGANIZATION IN THE COMPANY LIFECYCLE

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**Summary:** The aim of this study is to map the evolution of logistics organization in companies along their lifecycle. According to our hypothesis, different configurations of logistics organization appear at the different periods of companies' life. For the purpose of this study we used Larry E. Greiner's organizational growth model, which was first published in 1972, and actualized in 1998 by the author and the model for logistics organization of D. J. Bowersox et al., published in 2002. We drew a parallel between the two models using the similarities of the corresponding stages of development. We tested the parallelism on a sample of 97 Hungarian companies from the industrial and commercial sector. We assigned each sample company to a stage of the Greiner model using a fuzzy classification method, and then we analyzed the characteristics of logistics organizations for each growth stage. The results of the empirical analysis supported the parallelism between the two models. It can be used as a basis for further studies in this topic and also in practice for management consulting in the fields of organizational development and logistics.

**Keywords:** company lifecycle, logistics, organization

### 1. INTRODUCTION

Logistics organization is an important issue of international logistics literature. All authors agree in that logistics organization should suit to the internal and external environment of the company. Internally it means harmony with the company organizational structure and strategy, externally it means exploiting possibilities and meeting market expectations. Logistics operations should be effective and efficient in the same time. This means that growing companies need different logistics organizations as they go through their lifecycle.

Organizational growth models give detailed descriptions on company characteristics in each stage of their lifecycle, but do not give details on the different company functions – like logistics. In our opinion each stage of development require different contribution from the logistics function and different logistics organizational structure as well.

Defining ideal logistics organization to each stage may be useful for developing companies to form their logistics function.

### 2. LITERATURE REVIEW

#### 2.1. ORGANIZATIONAL GROWTH

Researchers of organizational development agree that growth of companies can be separated to well-defined stages (Greiner 1972, Churchill-Lewis 1983, Quinn-Cameron 1983, Miller-Friesen 1984, Baird-Meshoulam 1988, Kazanjian 1988, Timmons 1990, Milliman et al. 1991, Adizes 1992, Hurst 1995). Each stage can be characterized by behaviour in the market, organization and management problems. Researchers also agree that it is advantageous for a company if the manager is aware of the logic of growth models and the position of his/her company in the models. According to Göbölös and Gömöri (2004) this makes management more conscious and helps to prepare for future changes and probable management problems.

For the purpose of this study we used Larry E. Greiner's organizational growth model, which was first published in 1972, and actualized in 1998 by the author. It is one of the most often cited company growth models, and it is widely used in practice by management consultant companies. The main strengths of the model are that it is universal regarding sector and size, it is detailed enough for our purposes, and its stages are relatively well-defined and characteristic.

Table 1 lists the evolutionary and revolutionary periods defined by Greiner. Although Greiner interpreted one phase as a sequence of an evolutionary phase and a crisis, in our point of view crises have so unique characteristics that their interpretation as a separate phase is reasonable. In the following part of the article we use the abbreviations of the phases when referring to a phase.

**Table 1: Growth phases defined by Greiner (1972 and 1998)**

<i>Abbreviation</i>	<i>Name of phase</i>	<i>Abbreviation</i>	<i>Name of phase</i>
1P	Phase of Creativity	3C	Crisis of Control
1C	Crisis of Leadership	4P	Phase of Coordination
2P	Phase of Direction	4C	Crisis of Red Tape
2C	Crisis of Autonomy	5P	Phase of Collaboration
3P	Phase of Delegation	5C	Crisis of ? (Exhaustion)

Source: Greiner (1972, 1998)

We have no possibility to give details of each phase in this article due to limitations on length but we present the most important features of them from the point of view of this study in Table 2.

## 2.2. LOGISTICS ORGANIZATION

We reviewed four models for typical forms of logistics organization: Lambert et al. (1998), Bowersox et al. (2002), Frazelle (2002) and Rushton et al. (2006). We found Bowersox's approach is the most suitable as it is an evolutionary approach in contrast with Frazelle's, and it is more detailed than the other two evolutionary models. Dividing the functional integration into three steps makes it more suitable for finding correspondence between the growth phases and the logistics organization structures as integration can go on gradually. Therefore we use the Bowersox model as a basis and complete it with the ideas of the other three authors.

### *Stage 0. Fragmented functional structures*

These structures are typical for traditional or young organizations. Logistics activities are dispersed to Marketing, Manufacturing and Finance functions. (Bowersox et al. 2002). Lines of communication are unclear so it is often impossible to optimize the different logistics sub-functions for effectiveness and efficiency (Rushton et al. 2006).

### *Stage 1. Functional aggregation 1*

The first step towards integration is grouping the logistical activities within the original function. Typical aggregations in this phase are for example:

- marketing: aggregation of customer service activities
- manufacturing: aggregation of materials management activities. (Bowersox et al. 2002)

### *Stage 2. Functional aggregation 2*

Logistics as a separated function appears in the organizational chart with own authority and responsibility. The logistics department usually involves physical distribution and material

management at this stage. Weaknesses are limited communication and coordination between functions result in the lack of efficiency (Bowersox et al. 2002), and growing overall logistics costs and service level problems due to trade-offs. (Frazelle 2002)

#### *Stage 3. Functional aggregation 3*

In this phase of aggregation the aim is to integrate all possible logistical activities within the boundaries of a single functional unit and exploit synergies. The logistics function includes planning and operations as well, so logistics get into strategic level (Bowersox et al. 2002).

Advantage of the integration is that it can handle trade-offs, and overall logistics cost, service level and efficiency can be optimized (Frazelle 2002). Remaining weaknesses are:

- overall company performance is still not optimal, considering there is no full cooperation between the functions. (Lambert et al. 1998)
- it focuses on internal operations, the customers' expectations get less emphasis than needed. (Rushton et al. 2006)

#### *Stage 4. Process integration*

Process-oriented organizations are able to reach a higher level of service and productivity than functional organizations. Process management appears in process and matrix organization. (Frazelle 2002, Lambert et al. 1998, Rushton et al. 2006)

Process-oriented organizations also have to face problems and dilemmas:

- How can an organization be structured so that it can manage a process as complex as global logistics without becoming overly bureaucratic? (Bowersox et al. 2002)
- It is impossible to meet perfectly the demands of service quality and efficient operation at the same time. (Frazelle 2002)
- Coordination gets complicated due to functional egoism. (Lambert et al. 1998, Rushton et al. 2006)

#### *Stage 5. Virtuality and organizational transparency*

These are the organizations of the future, but some companies (for example Dell) already apply this structure. Logistics operations are dispersed to different functions or processes under the coordination of a CLO. Advanced IT systems provide coordination through common database and information sharing, making optimization possible not only in company level but across companies in the supply chain. (Frazelle 2002, Bowersox et al. 2002)

## **2.3. SYNTHESIS OF THE TWO MODELS**

The two models show several similarities. Both of them are evolutionary models, and they are similarly detailed. Both of them give a description to each stage of development using the same types of attributes (size, organizational questions, tasks assigned to operational or strategic level, delegation, use of planning and controlling methods, information flow). The correspondence of the two models is shown in Table 2.

**Table 2: Correspondence between Phases of growth (Greiner) and logistics organization (Bowersox)**

Organization (Bowersox et al.)	Characteristics of logistics organization	Characteristics of growth phase	Phase of growth (Greiner)
Stage 0. Fragmented functional structures	<ul style="list-style-type: none"> <li>No independent logistics organization</li> <li>Logistics activities dispersed to other functions</li> <li>Duplication of tasks</li> <li>Lack of functional coordination</li> </ul>	<ul style="list-style-type: none"> <li>No independent functional units</li> <li>Functions integrated to core activity</li> <li>Functional objectives not determined</li> </ul>	Phase 1: Creativity
Stage 1. Functional aggregation 1	<ul style="list-style-type: none"> <li>Grouping of some logistics tasks within the original function</li> <li>No integrated inventory management</li> </ul>	<ul style="list-style-type: none"> <li>Formulating functional units</li> <li>Functional and company objectives not harmonized</li> </ul>	Crisis 1: Leadership
Stage 2. Functional aggregation 2	<ul style="list-style-type: none"> <li>Independent logistics unit</li> <li>Involves physical distribution and material management</li> <li>Limited communication between functions</li> <li>No company-level optimization</li> </ul>	<ul style="list-style-type: none"> <li>Functional structure</li> <li>Basics of controlling and planning</li> <li>Middle line managers</li> </ul>	Phase 2: Direction
		<ul style="list-style-type: none"> <li>Executive is the only decision-maker</li> <li>Communication between functions only through the executive – decrease in performance due to overload</li> </ul>	Crisis 2. Autonomy
Stage 3. Functional aggregation 3	<ul style="list-style-type: none"> <li>Most logistics activities done in one unit</li> <li>Logistics on strategic level</li> <li>Company-level optimization in logistics</li> <li>Logistics information system</li> <li>Limited cooperation with other functions</li> </ul>	<ul style="list-style-type: none"> <li>Delegation of decision-making to functional managers</li> <li>Faster and more efficient operations and information flow</li> </ul>	Phase 3: Delegation
		<ul style="list-style-type: none"> <li>Lack of control over functional units</li> <li>Inconsistence between company and functional strategy</li> </ul>	Crisis 3: Control
Stage 4. Process integration	<ul style="list-style-type: none"> <li>Activities driven by the key performance objectives of the core process</li> <li>Intensive information flow between functions</li> <li>High-level service and productivity</li> <li>Conflicts between process and functional objectives</li> <li>Risk of being overly bureaucratic</li> <li>Coordination problems</li> </ul>	<ul style="list-style-type: none"> <li>Transparent structure and controlling system</li> <li>Fulfillment of company goals precisely tracked</li> <li>Effective and efficient operation</li> </ul>	Phase 4: Coordination
		<ul style="list-style-type: none"> <li>Growing bureaucracy</li> <li>Conflicts between management and operations</li> <li>Slowing decision-making, decreasing efficiency</li> </ul>	Crisis 4: Red tape
Stage 5. Virtuality and organizational transparency	<ul style="list-style-type: none"> <li>Desintegration of logistics processes</li> <li>Developed IT support</li> <li>Virtual integration and physical dispersion</li> <li>Integration with other functions and across the supply chain</li> </ul>	<ul style="list-style-type: none"> <li>Efficient cooperation between organizational units</li> </ul>	Phase 5: Collaboration

Source: own table based on Bowersox et al (2002) and Greiner (1972)

### 3. MATERIAL AND METHOD

#### 3.1. COMPANY SAMPLE

We have tested the parallelism of the two models on a sample of Hungarian companies. The observed companies were chosen by field of activity, where logistics is a relevant but not core activity and therefore the presence of the logistics organization is possible. Regarding to company size the minimum number on FTEs was 10. The observed companies are active in manufacturing or commerce.

C-level managers of the sample companies filled in a questionnaire in frames of a personal interview. Questionnaires were prepared between February and May 2009, the number of interviews made was 120. Only 97 of them were analysed due to insufficient answers on critical questions.

#### 3.2. RESEARCH METHODOLOGY

The first step of data processing was the assignment of sample companies to Greiner's growth phases (company classification). We used a fuzzy classification method for this purpose (Miskolczi-Gábor 2008, 2012). The classification was based on a group of questions dedicated to the attributes a company should have in each phase of growth. The interviewee had to mark on a four-grade scale, how characteristic are these attributes to their companies. The answers were then converted to fuzzy membership functions by using correspondence matrices in which we defined the relationship between each answer and the membership degree in each phase. The final step was the defuzzification of the membership function with MOM method to get a crisp (the one most typical) result for growth phase.

The second step was the analysis of logistics characteristics of the company based on a group of questions dedicated to logistics. The aim of this step was to check whether the companies classified into a given growth phase show the characteristics of the corresponding stage of logistics organization given in Table 2. We checked the following characteristics:

- existence and type of logistics organization,
- number of employees doing logistics-related tasks,
- logistics related activities done by the companies (number and type),
- location of the tasks above (operational and strategic) in the organizational structure.

### 4. RESULTS

After the classification of companies we got the result shown in Table 3:

*Table 3: Result of classification*

<i>Growth phase</i>	<i>No. of companies</i>	<i>Growth phase</i>	<i>No. of companies</i>
1P	24	4P	3
1C	21	4C	2
2P	18	5P	6
2C	13	5C	3
3P	1	not classified	5
3C	1	<b>Total</b>	<b>97</b>

Source: own research

For the existence and type of logistics organization we got the results shown in Table 4.

**Table 4: Logistics organization in the growth phases**

<i>Phase</i>	<i>No. of companies</i>	<i>Logistics organization</i>		
		<i>none</i>	<i>simple</i>	<i>integrated</i>
1P	24	<b>100%</b>	0%	0%
1C	21	<b>100%</b>	0%	0%
2P	18	<b>78%</b>	22%	0%
2C	13	<b>77%</b>	15%	8%
3P	1	<b>100%</b>	0%	0%
3C	1	0%	<b>100%</b>	0%
4P	3	0%	33%	<b>67%</b>
4C	2	0%	<b>100%</b>	0%
5P	6	0%	17%	<b>83%</b>
5C	3	0%	0%	<b>100%</b>

Source: own research

There were no companies in phases 1P and 1C where the name of the unit carrying out logistics activities contained the word “logistics”. The typical organizational units doing logistics activities were “production”, “sales” and “maintenance/engineering” depending on the core activity of the company. The average number of logistics-related employees was 2.1 in 1P and 4.9 in 1C.

In phase 1P all of the planning and controlling activities were done by the company manager, employees performed operational tasks. The most often mentioned tasks were the following:

- Operative purchasing
- Providing information on suppliers to production
- Material handling
- Preparation of material for production
- Providing information on production to warehouse
- Quality check
- Packaging, finishing
- Providing information on stocks to sales
- Commission
- Distribution
- Return goods handling
- Waste handling

The employees were not grouped by activity in 1P. This organizational structure became a little more sophisticated in 1C where subgroups appeared within the three functions mentioned above such as “purchasing”, “warehouse”, “distribution” and “service department”.

Logistics organization appears first in phases 2P-2C. This unit involves at least the activities connected to physical distribution, and the word “logistics” appears in its name. However, logistics is not considered at strategic level, and activities such as purchasing, inventory management or packaging still belong to the production unit. The average number of employees performing logistics tasks is 8.1 in 2P and 13.1 in 2C. The most often mentioned tasks were:

- Operative purchasing
- Providing information on suppliers to production
- Material handling
- Packaging, finishing
- Providing information on production to warehouse
- Inventory management
- Providing information on stocks to sales
- Commission
- Distribution
- Return goods handling
- Waste handling

For phases 3P and 3C we do not have statistically relevant results due to the small number of companies, but both of the two companies of these phases have logistics unit. The number of companies in the rest of the phases is still small to draw significant conclusions, but we have found that 15 out of the 16 companies have organizational unit dedicated to logistics, and in phases 5P-5C all companies have process organization (stage 4 in the Bowersox model).

For logistics activities we found that the first activities carried out by the logistics unit belong to physical distribution, while planning and control of logistics processes stay in the hands of top management or controlling even in higher levels of growth. Only 2 companies of the phases 5P and 5C delegated these tasks to the logistics organization.

Overall, the results of the survey confirmed the parallelism of the two models in case of the stages where the number of companies were sufficient for statistical analysis. In the case of the other stages characteristics were also in accordance with the Bowersox model.

## 5. CONCLUSION

One of the most important result of this study that we determined the stage of development and the typical organizational structure of company logistics along the Greiner model. As a basis for possible structures of logistics organization we took the configurations given by Bowersox et al. (2002). In the course of the survey, we found a parallelism between the growth phases of the Greiner model and the stages of development of logistics organization defined by Bowersox. The survey data validated the correspondence between the two models. This parallelism can be used in further scientific or practical analysis of company logistics: if a company is classified in the Greiner model, a typical structure of logistics organization can be defined for it. This helps managers in situations of taking up new activities, rapid growth of employee number, organizational changes and reorganization of processes, and it can also be a good tool for management consultants.

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